REMARKS

Claims 1-8, 19, 20, 31, 34 and 37-42 are pending in the present application. Claims 1, 19, 20, 31, 34, 39 and 41 have been amended, claim 42 has been added and claims 9-18, 21-30, 32, 33, 35 and 36 have been canceled by a previous amendment. Claims 1, 19, 20, 39 and 41 are independent. Reconsideration of this application, as amended, is respectfully requested.

Information Disclosure Statement

An Information Disclosure Statement was submitted to the U.S. Patent Office on March 14, 2006. The Examiner has also acknowledged receipt of the Information Disclosure Statement by initialing the PTO/SB/08 form attached thereto. However, one of the references listed on the PTO/SB/08 form was incorrect. Specifically, U.S. Patent No. 6,411,545 (Caywood) should have been U.S. Patent No. 6,511,545 (Banno).

A new Information Disclosure Statement is attached hereto for the Examiner's consideration. This Information Disclosure Statement includes an PTO/SB/08 form that lists the Banno reference thereon. It is respectfully requested that the Examiner consider the Information Disclosure Statement and forward a copy of the initialed PTO/SB/08 form with the next Official Communication.

Objection to the Specification

The specification stands objected to because the Abstract of the Disclosure is not in proper form. As the Examiner will note, the Abstract of the Disclosure has been amended to address the

Examiner's objections. Reconsideration and withdrawal of the specification objection are therefore respectfully requested.

Rejection Under 35 U.S.C. § 112

Claims 1, 19, 20 and 31 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

The Examiner asserts that the recitations "said add on jetting being performed without masking or stenciling" and "one drop at a time" are not in the original disclosure and are therefore new matter. While not conceding to the appropriateness of the Examiner's rejection, in order to expedite prosecution, these recitations have been deleted from claims 1, 19, 20 and 31 (and from claim 49, which was not rejected by the Examiner).

In view of the above, the Examiner's rejection under 35 U.S.C. § 112, first paragraph, has been rendered moot. Reconsideration and withdrawal of this objection are therefore respectfully requested.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1, 8, 19, 20, 31 and 39 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al., U.S. Patent No. 6,296,896. Claims 1, 8, 19, 20, 31 and 37-41 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Zandman et al., U.S. Patent No. 6,271,060. Claim 34 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al. or Zandman et al. Claims 2-7 stand rejected under 35 U.S.C. § 103(a) as being

unpatentable over Takahashi et al. or Zandman et al. in view of Itsuji, U.S. Patent No. 5,151,299. These rejections are respectfully traversed.

The present invention is directed to a method of applying viscous medium on a substrate. Each of independent claims 1, 19, 20, 39 and 41 recite "said substrate being arranged for mounting of components thereon." In addition, each of the independent claims recite "add-on jetting" or "jetting additional viscous medium" onto the substrate "prior to hardening of the screen printed viscous medium." Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the present invention as recited in the independent claims.

It should be noted that the above recitations in the independent claims of the present invention are supported by the original disclosure due to at least page 8, second full paragraph of the present specification that discloses components being mounted onto the substrate 1 after the add-on jetting step. As one having ordinary skill in the art would realize, the screen printed medium and the add-on jetting medium would have to still be in a viscous form when components are mounted thereto. Therefore, the add-on jetting must occur prior to hardening of the screen printed medium. In view of this, the amendments to the claims presented by this Amendment do not involve new matter.

With regard to the Takahashi et al. reference relied on by the Examiner, this reference is directed to a method for manufacturing an electron-emitting device, a method for manufacturing an electron source and a method for manufacturing an image forming apparatus. In view of this, Takahashi et al. is not directed to a method of applying viscous medium on a substrate, where the substrate is "arranged for mounting components thereon" as recited in the independent claims of the present invention. No components are mounted on the substrate of Takahashi et al.

Therefore, Takahashi et al. fails to anticipate the independent claims of the present invention for at least this reason.

With regard to the Zandman et al. reference relied on by the Examiner, this reference is directed to a process of fabricating a chip scale surface mount package for a semiconductor device. Referring to column 4, lines 7-12 of Zandman et al., it is disclosed that the method is directed to the manufacture of a semiconductor wafer. Therefore, no components are mounted to the substrate of Zandman et al. In view of this, Zandman et al. fails to disclose a method of applying viscous medium on a substrate, where the substrate is "arranged for mounting components thereon" as recited in the independent claims of the present invention. Therefore, Zandman et al. also fails to anticipate the independent claims of the present invention for at least this reason.

In addition to the above, in the present invention, the "add-on jetting" or the "jetting additional viscous medium" is performed "prior to hardening of the screen printed viscous medium." Applicants submit that the references relied on by the Examiner also fail to disclose this aspect of the present invention.

In particular, as explained by the Examiner, Takahashi et al. discloses screen printing an insulating substrate with a conductive material to form, for example, electrodes 2 and 3 (see Figure 3A of Takahashi et al.). Additional material is then applied to the screen printed substrate by an ink jet method. Specifically, an electroconductive film forming material 32 and a decomposer 34 are applied to the screen printed substrate via nozzles 31 and 33, respectively. The substrate is then dried and baked to form an electroconductive thin film 4 to form an

electrode-emitting region on the substrate (see column 3, first full paragraph and Figures 3A-3D).

Taking the above into consideration, it appears that Takahashi et al. discloses "add-on jetting" or "jetting additional viscous medium" as recited in the independent claims of the present invention. However, one having ordinary skill in the art would recognize that the film forming material 32 and the decomposer 34 are applied to the screen printed substrate after hardening of the electrodes 2 and 3. Therefore, Takahashi et al. fails to disclose jetting viscous material "prior to hardening of the screen printed viscous medium" as in the presently claimed invention.

Although it is true that the drying and baking step is performed after the jetting of medium in Takahashi et al., Applicants submit that it is inherent in Takahashi et al. that there is also hardening of the electrodes 2 and 3 after the screen printing step. Specifically, the screen printed medium that forms the device electrodes 2 and 3 is hardened before any jetting is performed.

This can be understood from a review of Takahashi et al. For example, at column 12, lines 34-37 of Takahashi et al., it is disclosed that the electroconductive film 4 (applied by jetting) is formed after fabricating the device electrodes 2 and 3. The description "...after fabricating..." can only mean that the electrodes have been fully formed, i.e. in the rigid form achieved after hardening. This is also implied in column 12, lines 56-61, column 14, lines 32-36 and under EMBODIMENT 1 at column 24.

Applicants submit that it is also evident from Figures 19A-19E because the device electrodes 2 and 3 have the same fixed shape before and after applying the jetted viscous

medium. If the device electrodes were still in a viscous condition when the additional medium is jetted thereupon, there would be at least a difference in the shape of the device electrodes, and possibly even an interaction or mixing between the two viscous media applied onto each other. Instead, there is no change at all in the shape of the device electrodes, since they have already been subjected to a hardening process. Furthermore, at column 35, lines 46-53, it is disclosed that the electrodes "formed by ... screen printing" have many porous holes. One having ordinary skill in the art would realize that such holes would only be formed after hardening of the electrodes. Therefore, this is further evidence that Takahashi et al. fails to disclose jetting of medium prior to hardening of the screen printed medium as in the presently claimed invention.

It is unlikely that one having ordinary skill in the art would be interested in applying a viscous material onto another viscous material, unless a mixing or other interaction of the two is desired. Applicants respectfully submit that this is simply not how it is done. Thus, one having ordinary skill in the art would not read Takahashi et al. as disclosing a method in which a viscous medium is applied onto a different viscous medium, as would have to be interpreted by the Examiner to meet the independent claims of the present invention. In view of this, Takahashi et al. fails to anticipate the present invention as recited in the independent claims.

With regard to the Examiner's reliance on the Zandman et al. reference, Applicants submit that this reference discloses the same thing as Takahashi et al. with regard to when the jetted medium is applied. In other words, the jetted material is applied after hardening of the screen printed medium.

Specifically, referring to Figure 2B of Zandman et al., the polymer 210 is applied by, for example, screen printing, leaving pads 208G and 208S within the polymer 210. Referring to

Figures 7A and 7B, solder balls 219 are then applied to the screen printed substrate. One having ordinary skill in the art would recognize that the solder balls 219 are applied after the polymer 210 has hardened at least due to that various processes that occur between the application of the polymer 210 and the solder balls 219. For example, column 5, lines 40-64 describe laser marking the screen printed substrate, cutting the screen printed substrate and braking the screen printed substrate into strips 214. Applicants submit that it would be difficult, if not impossible, to perform these steps without prior hardening of the polymer 210. In addition, referring to Figure 3 of Zandman et al., the strips 214 are stacked one on top of the other, with the polymer 210 of one strip 214 contacting a bottom of an adjacent strip 214. It is inherent in Zandman et al. that the polymer 210 must be hardened at this time to prevent the strips from sticking together. Finally, as mentioned above, the polymer 210 retains its shape throughout the various processing steps, which would not be the case if the polymer were not in a hardened form.

In summary, Applicants respectfully submit that the Takahashi et al. and Zandman et al. references fail to disclose a method of applying viscous medium on a substrate that is "arranged for mounting components thereon" as recited in the independent claims. Also, the Takahashi et al. and Zandman et al. references fail to disclose an "add-on jetting" step or "jetting additional amounts of viscous material" "prior to hardening of the screen printed viscous medium" as recited in the independent claims of the present invention. Therefore, these references fail to anticipate the independent claims of the present invention.

With regard to dependent claims 2-8, 31, 34, 37, 38 and 40, Applicants respectfully submit that these claims are allowable due to their respective dependence upon the allowable independent claims, as well as due to the additional recitations in these claims.

With regard to the Itsuji reference relied on by the Examiner, this reference has been relied on by the Examiner for its teaching of removal of screen printed material. Itsuji fails to disclose the application of viscous material prior to hardening of a screen printed medium as recited in the independent claims of the present invention. Therefore, Itsuji fails to make up for the deficiencies of Takahashi et al. and Zandman et al.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-8, 19, 20, 31, 34 and 37-41 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejections under 35 U.S.C. § 103 are respectfully requested.

Additional Claim

Additional claim 42 has been added for the Examiner's consideration. Applicants respectfully submit that this claim is allowable due to its dependence on independent claim 1, as well as due to the additional recitations in this claim.

Favorable consideration and allowance of additional claim 42 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: February 20, 2007

Respectfully submitted,

By _____

Paul C. Lewis
Registration No.: 43,368
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant